

OPTICAL REDUCTION SYSTEM WITH CONTROL OF ILLUMINATION POLARIZATION

ABSTRACT OF THE DISCLOSURE

An optical reduction system with polarization dose sensitive output for use in the photolithographic manufacture of semiconductor devices having variable compensation for reticle retardation before the long conjugate end. The variable compensation component(s) before the reticle provides accurate adjustment of the polarization state at or near the reticle. The variable compensation components can be variable wave plates, layered wave plates, opposing mirrors, a Berek's compensator and/or a Soleil-Babinet compensator. The catadioptric optical reduction system provides a relatively high numerical aperture of 0.7 capable of patterning features smaller than 0.25 microns over a 26mm x 5mm field. The optical reduction system is thereby well adapted to a step and scan microlithographic exposure tool as used in semiconductor manufacturing. Several other embodiments combine elements of different refracting power to widen the spectral bandwidth which can be achieved.

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